NASA
Glenn
Success
Stories

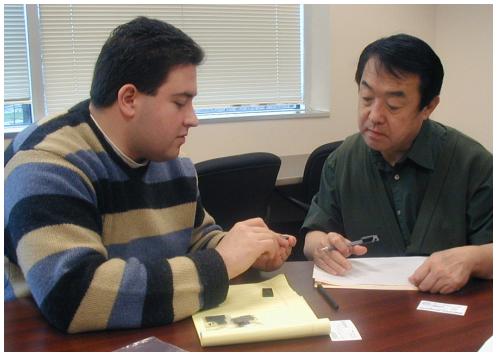
Wear Tests Confirm Value of New Spinal Implants

TECHNOLOGY

Diamond-like carbon (DLC) coatings were developed by NASA to protect spacecraft surfaces from the environment in low-earth orbit. Wear tests are used by NASA to characterize durability, wear-resistance, and strength properties of interacting moving surfaces.

COMMERCIAL APPLICATION

Spinal implants help millions of patients recover from debilitating back injuries by strengthening the vertebrate until the bone can fuse. Theken Surgical has developed a new implant of a proprietary material that, unlike traditional implants, will allow doctors to use standard X-rays to monitor the healing process.



Mort Albert of Theken demonstrates spinal implants to Dr. Miyoshi of NASA Glenn.

Before going to market, Theken needed proof that their material's wear properties met FDA standards. Moreover, Theken was considering improving the material by using DLC coatings for a near friction-free surface. GLITeC identified a researcher at NASA Glenn whose experience in characterizing wear properties of surfaces included DLC coatings. NASA characterized Theken's four types of implants (two coated versions and two uncoated versions), which are made by two separate manufacturing processes.

SOCIAL/ECONOMIC BENEFIT

NASA's wear tests clearly showed that the manufacturing process had a greater affect on the wear properties of the material than whether it was coated or not. Further, results showed that wear of the uncoated part was significantly less than other FDA-approved implant materials. This is good news for Theken, who can now manufacture the implant at significantly lower cost.

NASA APPLICATIONS

NASA continually seeks to develop and characterize new materials for purposed such as high temperature clean burning jet engines and spacecraft in lower Earth orbit. This fundamental understanding of why and how materials behave provides a wealth of information for new product designers.

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